CLAIMS:

1.   A method of processing seismic data acquired using a seismic source array that emits, in use, a seismic wavefield having a frequency spectrum within the seismic bandwidth that does not contain a source ghost at a non-zero frequency, the method comprising processing the acquired seismic data thereby to attenuate the effect of ghost reflections in the seismic data.

2.   A method as claimed in claim 1 wherein the seismic source array emits, in use, a seismic wavefield having a frequency spectrum that does not contain a source ghost at a non-zero frequency in the frequency range up to 500Hz, for a take-off angle of up to 45°.

3.   A method as claimed in claim 1 and comprising processing the acquired seismic data to attenuate the effects of receiver-side ghost reflections.

4.   A method as claimed in claim 1 wherein the processing step comprises separating the acquired seismic data into an up-going constituent and a down-going constituent.

5.   A method of acquiring seismic data comprising the steps of:
a)   actuating a seismic source array to emit seismic energy having a frequency spectrum that does not contain a source ghost notch at a non-zero frequency within the seismic bandwidth;
b)   acquiring seismic data at a seismic receiver; and
c)   processing the acquired seismic data according to a method defined in claim 1 thereby to attenuate the effect of ghost reflections.

6.   A method of acquiring seismic data comprising the steps of:

a)   actuating a seismic source array to emit seismic energy having a frequency spectrum that does not contain a source ghost notch at a non-zero frequency within the seismic bandwidth;

b)   acquiring seismic data at a seismic receiver; and

c)   processing the acquired seismic data thereby to attenuate the effect of ghost reflections.

7.   A method as claimed in claim 5 wherein the source array comprises a first seismic source and a second seismic source disposed, in use, below the first seismic source.

8.   A method as claimed in claim 6 wherein the source array comprises a first seismic source and a second seismic source disposed, in use, below the first seismic source.

9.   A method as claimed in claim 7 wherein the second seismic source is disposed, in use, vertically below the first seismic source.

10.   A method as claimed in claim 8 wherein the second seismic source is disposed, in use, vertically below the first seismic source.

11.   A method as claimed in claim 7 wherein step (a) comprising actuating the second source a pre-determined time after actuating the first source.

12.   A method as claimed in claim 8 wherein step (a) comprising actuating the second source a pre-determined time after actuating the first source.

13.   A method as claimed in claim 11 wherein the pre-determined time is substantially equal to the travel time of seismic energy from the first seismic source to the second seismic source.

14.   A method as claimed in claim 5 wherein the or each seismic source in the source array is disposed substantially at the surface of a water column.

15.   A method as claimed in claim 6 wherein the or each seismic source in the source array is disposed substantially at the surface of a water column.

16.   A method as claimed in claim 5 wherein the source array comprises means for absorbing upwardly-emitted seismic energy.

17.   A method as claimed in claim 6 wherein the source array comprises means for absorbing upwardly-emitted seismic energy.

18.   A method as claimed in claim 5 wherein the source array comprises means for inducing positive reflection of upwardly-emitted seismic energy.

19.   A method as claimed in claim 6 wherein the source array comprises means for inducing positive reflection of upwardly-emitted seismic energy.

20.   An apparatus for processing seismic data acquired using a seismic source array that emits, in use, a seismic wavefield having a frequency spectrum that does not contain a notch at a non-zero frequency, the apparatus comprising means for processing acquired seismic data thereby to attenuate the effect of ghost reflections in the seismic data.

21.   An apparatus as claimed in claim 20 and adapted to process acquired seismic data to attenuate the effects of receiver-side ghost reflections.

22.   An apparatus as claimed in claim 20 and adapted to separate acquired seismic data into an up-going constituent and a down-going constituent.

23.   An apparatus as claimed in claim 20 and comprising a programmable data processor.

24.   A seismic surveying arrangement comprising:

a seismic source array that emits, in use, a seismic wavefield having a frequency spectrum that does not contain a notch at a non-zero frequency;

one or more seismic receivers for acquiring seismic data; and

an apparatus as defined in claim 20 for processing seismic data acquired at the one or more receivers.

25.   A seismic surveying arrangement as claimed in claim 24 wherein the source array comprises a first seismic source and a second seismic source disposed, in use, below the first seismic source.

26.   A seismic surveying arrangement as claimed in claim 25 wherein the second seismic source is disposed, in use, vertically below the first seismic source.

27.   A seismic surveying arrangement as claimed in claim 25 and further comprising means for actuating the second source a pre-determined time after actuating the first source.

28.   A seismic surveying arrangement as claimed in claim 27 wherein the pre-determined time is substantially equal to the travel time of seismic energy from the first seismic source to the second seismic source.

29.   A seismic surveying arrangement as claimed in claim 24 wherein the or each seismic source in the source array is disposed, in use, substantially at the surface of a water column.

30.   A seismic surveying arrangement as claimed in claim 24 wherein the source array comprises means for absorbing upwardly-emitted seismic energy.

31.   A seismic surveying arrangement as claimed in claim 24 wherein the source array comprises means for inducing positive reflection of upwardly-emitted seismic energy.

32.   A storage medium comprising a program for a data processor of an apparatus as defined in claim 23.

33.   A storage medium containing a program for controlling a data processor to perform a method as defined in claim 1.